

REMARKS

Formal Matters

Claims 8-29 and 51-58 are pending after entry of the above amendments.

Claims 8-29 and 51-58 were examined. Claims 8-29 and 51-58 were rejected.

Applicants respectfully request reconsideration of the application in view of the amendments and remarks made herein.

No new matter has been added.

The Office Action

Claims Rejected Under 35 U.S.C. Section 103(a) (Infanti in view of AAPA and Chung et al.)

Claims 8-11, 18-23, 26-29, 51-53 and 54-57 were rejected under 35 U.S.C. Section 103(a) as being unpatentable over Infanti (Microsoft Visio 2002: 10 Minute Guide, 2002) in view of "Applicant's Admitted Prior art" (AAPA) in further view of Chung et al. (Kleisli: a new tool for data integration in biology, 1999).

With regard to claim 8, the Examiner asserted that Chung et al. teaches a local format infrastructural layer configured to transform specific biological information represented in a text, experimental data or biological diagram format to a local format, such that data from said text format, said experimental data format and said biological diagram format (sic, format) are all represented in said local databases of different formats and transforms the data to a common format.

Applicants respectfully traverse. Figure 1 of Chung et al. is a schematic diagram showing the Kleisli query engine, which performs the tasks of parsing, optimizing and executing queries. The Kleisli query engine uses driver interfaces to communicate with outside data sources or application programs. The drivers retrieve output data from the various sources and transform them into the CPL: data-exchange format. The retrieved data are evaluated, transformed and integrated by the CPL-Kleisli core. Thus, Kleisli is a tool that can be used to query databases of different formats and can retrieve data of various formats and warehouse it in a single data warehousing space. Fig. 2b shows a portion of the results of a Kleisli operation, in which the results are provided in the form of a flat file. There is no

teaching or suggestion by Chung et al. that the results provided in the CPL format can be exchanged. For example, there is no disclosure or suggestion that textual data in a CPL file can be converted to graphically represented data.

Further, claim 1 has been amended above to further clarify the distinction of the local format of the present invention relative to Kleisli. Claim 1 has been amended to further recite that the specific biological information is represented in local format objects in a canonical or abstract representation. It is respectfully submitted that none of the applied references teach or suggest these features. Support for this amendment can be found, for example, at paragraphs [0076] and [0091].

Further, the data stored by Kleisli in the CPL language is not standardized or universal so that applications can be plugged into the data and use it. Accordingly, the data in the CPL language is not exchangeable. Any application must know the particulars of the search that was used to retrieve that batch of data. This is evident when reviewing Box 1, page 353, which shows that the data combination by Kleisli is based on strict formatting requirements as to where the data is placed in the reports. Such data is not standardized, since if a second query different from the one shown in Box 1 is run on Kleisli, the data stored by the second query cannot be combined with the data from the Box 1 query based only on the data itself. That is, the CPL code or query language would be required for both searches in order to try and match up data from each search, and likely a third group of code instructions would be required before Kleisli could perform this operation.

In contrast, the present invention converts the data into a local format that is standardized, so that it can be used across platforms and by plugging various programs and applications into access with such data. Thus, the present invention extracts and transforms data into a biological model represented in terms of the local format. Kleisli merely searches for data from disparate data sources and warehouses the search results according to collection programming language such that the structure of the converted data is highly dependent upon the query that was constructed to retrieve the data. As such, the data cannot be readily combined from data found by another Kleisli search and therefore cannot accurately be considered a "local format" as defined by the present invention.

Regarding claim 9, the Examiner asserted that Infanti teaches means for connecting common elements of said stencils with assigned specific biological data to display a biological diagram. Applicants respectfully traverse, since Infanti does not disclose or teach that the data and information is biological data or biological information, and Chung et al. provides no capability of exchange among files, as noted above..

As to claim 18, it is respectfully submitted that Infanti does not teach means for navigating to data selected from said specific biological data for at least the same reason noted above with regard to claim 9.

With regard to claims 19 and 20, it is respectfully submitted that these claims are allowable over the cited art for at least the same reasons provided above with regard to claim 8, since claims 19 and 20 depend from claim 8.

Regarding claim 21, the Examiner referred to pages 113-114 of Infanti and asserted that Infanti teaches means for mapping between said selected stencils containing specific biological data and an existing biological diagram. Applicants respectfully traverse. Although the pages referred to disclose embedding and linking Visio files, there is no disclosure of specific biological data, existing biological diagrams, or mapping between stencils and an existing biological diagram. Nor does Chung et al. address this issue.

Regarding claim 23, Applicants respectfully submit that Infanti clearly fails to teach means for merging stencils with a biological network, or means for displaying said stencils merged with said biological network, contrary to the Examiner's assertions. The Examiner asserted: "Infanti in view of AAPA teaches means for merging said stencils with a biological network and means for displaying said stencils merged with said biological network". Applicants respectfully traverse. Directly contrary to the Examiner's assertion, the present specification (referred to by the Examiner is "AAPA") specifically discloses at paragraph [0008], that Visio is not adapted for building biological diagrams, and therefore is not suited for generating biological network information, such as protein-protein interaction networks, via knowledge extraction.

With regard to claim 26, the Examiner asserted that "Chung teaches the using a local formatting language of said local format infrastructural layer to transform textual data to graphical data (page 1) to give data meaning and make it more understandable."

Applicants respectfully traverse. Applicants were unable to find any disclosure by Chung et al. of transforming textual data to graphical data, contrary to the Examiner's assertion. Further, Applicants note that Applicants' copy of the Chung et al. reference ranges from pages 351 to 355 and therefore does not have a "page 1". Applicants did review page 351, the first page of the reference, but were unable to locate any disclosure of transforming textual data to graphical data.

As to claim 29, it is respectfully submitted that pages 63 and 64 clearly do not disclose overlaying annotations on a biological diagram, contrary to the Examiner's assertions.

As to claim 51, it is respectfully submitted that none of Infanti, AAPA, or Chung et al., whether taken alone or in any proper combination, teaches, suggests or discloses graphical elements comprising biological semantics representative of a particular type of biological entity or interaction. The Examiner has already admitted that Infanti does not disclose or teach that the data and information that is biological data or biological information. Neither AAPA nor Chung et al. discloses graphical elements comprising biological semantics representative of a particular type of biological entity or interaction. Still further, none of the applied references transforms data from different formats to a local format in a manner as claimed, as noted above.

As to claim 52, it is respectfully submitted that none of Infanti, AAPA, and Chung et al., whether taken alone or in any proper combination, teaches, discloses or suggests representing a visual grammar in a local format, for reasons already noted above. Contrary to the Examiner's assertion, Infanti does not provide the information in a local format. Although shapes can be dragged to a Visio document, textual data must first be formatted to be placed in text boxes, see p. 62. Although Visio data can be embedded into another application document, it is not in a local format and thus is not simply combined or merged with that other application document, but must be embedded. Further, there is no indication, teach, or suggestion by Chung et al. that information can be extracted from a CPL file for use in a Visio document.

Regarding claim 53, Applicants traverse the Examiner's assertion that Infanti teaches said slots are filled with specific biological information, as this is contrary to the Examiner's earlier admission that Infanti does not disclose or teach that the data and information is biological data or biological information. It is further respectfully submitted that Infanti does not use a local format as claimed, for reasons noted above, and that pages 63-64 of Infanti do not disclose automatically adding biological information to a local format, but only disclose entering text into a shape. There is no disclosure of conversion of the text to a local format. Quite to the contrary, text must be formatted before filling it into a text box as noted on page 62. Since this formatting is required, it is clear that the text has not been previously converted to a local format that is readily combinable with data from biological diagrams and experimental data. Further, if a user wanted to use the data appearing as text in a text box of the Visio display for use in a textual document, the user would presumably again need to format the data as it is not in a local format. Still further, the Examiner asserted that specific biological information is automatically added to the local format, and the Infanti teaches this at pages 63-64. Applicants strongly traverse. Pages 63-64 clearly indicate that the user must "double-click a shape to open its text box" and then type to add or edit text, see the last three line of page 63. Clearly this is not automatic entry, nor is

it entry of specific biological information whatsoever. Still further, it is respectfully submitted that Chung et al. does not cure any of these deficiencies, since there is not suggestion that the data in the flat file of Chung et al. that is provided in the CPL format is extractable for use in a Visio file. To the contrary, the Chung et al. disclosure suggests that the data would not be useable for in such a manner.

Regarding claim 54, it is respectfully submitted that none of Infanti, AAPA or Chung et al., whether taken alone or in any proper combination, discloses, suggests, or pertains to stencils existing at multiple levels of abstraction, ranging from molecular interaction to higher-level biological concepts. The Examiner referred to page 148 of Infanti. However, page 148 of Infanti discloses nothing about stencils provided for levels of abstraction ranging from molecular interaction to higher-level biological concepts. Rather, page 148 merely discloses that stencil files can be modified to add more shapes, remove shapes and edit existing shapes.

In view of the above amendments and remarks, the Examiner is respectfully requested to reconsider and withdraw the rejection of claims 8-11, 18-23, 26-29, 51-53 and 54-57 under 35 U.S.C. Section 103(a) as being unpatentable over Infanti (Microsoft Visio 2002: 10 Minute Guide, 2002) in view of "Applicant's Admitted Prior art" (AAPA) in further view of Chung et al. (Kleisli: a new tool for data integration in biology, 1999), as being inappropriate.

Claims Rejected Under 35 U.S.C. Section 103(a) (Infanti in view of AAPA, Chung et al. and Flowtronex)

Claims 12-17 were rejected under 35 U.S.C. Section 103(a) as being unpatentable over Infanti (Microsoft Visio 2002: 10 Minute Guide, 2002) in view of "Applicant's Admitted Prior art" (AAPA) in further view of Chung et al. (Kleisli: a new tool for data integration in biology, 1999), as applied to claim 8 above, and further in view of Flowtronex - Apprentice Systems – Microsoft Case Study (August 2001).

Regarding claim 12, the Examiner admitted that Infanti does not teach data that is biological data or designing and associating rules with stencils. The Examiner asserted that Chung et al. teaches a local format infrastructural layer. As noted above with regard to claim 8, Chung et al. fails to convert data from different formats into a local format so that these data are readily useable together in either a text, biological diagram, or experimental data display. The Examiner asserted that Flowtronex teaches an overlay onto Visio that designs and applies rules to Visio shapes. The Examiner further asserted that it would have been obvious to combine the system of diagramming biological data of Infanti in view of

AAPA and Chung et al. with the designing and applying of rules to Visio master shapes to eliminate manual processing by creating an automatic process.

Applicants respectfully traverse. For reasons provided above with regard to claim 8, it is respectfully submitted that it would not have been obvious to combine AAPA and Chung et al. with Infanti in the manner described by the Examiner, or that even if combined as suggested by the Examiner, the combination would still lack “a local format infrastructural layer executable by said processor and configured to transform specific biological information represented in a text, experimental data or biological diagram format to a local format that provides a common format, such that data from said text format, said experimental data forma and said biological diagram format are all representable in said local format and are exchangeable and useable together”, since none of those references discloses teaches or suggest such a local format infrastructural layer as claimed, wherein the data is exchangeable, such that, for example, textual data converted to the local format can be represented as graphical data. Further, it is respectfully submitted that Flowtronex also fails to make up for this deficiency of the other three applied references.

Since claims 12-17 depend from claim 8, it is respectfully submitted that these claims are allowable over the applied art of record, for at least the same reasons that claim 8 patentable defines over the applied art of record.

With regard to claim 15 it is respectfully submitted that none of the applied references suggest rule checking rules against a pre-existing biological diagram. Likewise, none of the references disclose or suggest rule checking rules against experimental data, as recited in claim 16.

Regarding claim 17, the Examiner indicated that Flowtronex teaches an overlay onto Visio that designs and assigns rules to Visio shapes. However, claim 17 depends from claim 12. Claim 12 recites means for designing and associating rules with said stencils. Claim 17 further recites means for overlaying results of rule checking on a network diagram. It is respectfully submitted that Flowtronex lacks any disclosure of overlaying results of rule checking on anything, much less a network diagram. It is further respectfully submitted that Infanti, AAPA and Chung et al. also fail to disclose this feature.

In view of the above amendments and remarks, the Examiner is respectfully requested to reconsider and withdraw the rejection of claims 12-17 under 35 U.S.C. Section 103(a) as being unpatentable over Infanti (Microsoft Visio 2002: 10 Minute Guide, 2002) in view of “Applicant’s Admitted Prior art” (AAPA) in further view of Chung et al. (Kleisli: a new tool for data integration in biology, 1999), as applied to claim 8 above, and further in view of Flowtronex - Apprentice Systems – Microsoft Case Study (August 2001). as being inappropriate.

Claims Rejected Under 35 U.S.C. Section 103(a) (Infanti in view of Chung et al. and Artymuik et al.)

Claims 24-25 were rejected under 35 U.S.C. Section 103(a) as being unpatentable over Infanti (Microsoft Visio 2002: 10 Minute Guide, 2002) in view of “Applicant’s Admitted Prior art” (AAPA) in further view of Chung et al. (Kleisli: a new tool for data integration in biology, 1999), as applied to claim 8 above, and further in view of Artymuik et al., “The Use of Graph Theoretical Methods for the Comparison of the Structures of Biological Macromolecules, 1995).

The Examiner asserted that it would have been obvious to include the use of graph theoretic methods to compare a plurality of stencils for examining and comparing of macromolecular structures.

Applicants respectfully submit that Artymuik et al. does nothing to make up for the deficiencies of deficiencies of Infanti, AAPA and Chung et al. in meeting claim 8, since Artymuik et al. also fails to disclose or suggest “a local format infrastructural layer executable by said processor and configured to transform specific biological information represented in a text, experimental data or biological diagram format to a local format that provides a common format, such that data from said text format, said experimental data forma and said biological diagram format are all representable in said local format and are exchangeable and useable together”. Further, since claims 24-25 depend from claim 8, it is respectfully submitted that these claims are allowable over the applied art of record, for at least the same reasons provided above with regard to claim 8.

In view of the above amendments and remarks, the Examiner is respectfully requested to reconsider and withdraw the rejection of claims 24-25 under 35 U.S.C. Section 103(a) as being unpatentable over Infanti (Microsoft Visio 2002: 10 Minute Guide, 2002) in view of “Applicant’s Admitted Prior art” (AAPA) in further view of Chung et al. (Kleisli: a new tool for data integration in biology, 1999), as applied to claim 8 above, and further in view of Artymuik et al., “The Use of Graph Theoretical Methods for the Comparison of the Structures of Biological Macromolecules, 1995), as being inappropriate.

Claim Rejected Under 35 U.S.C. Section 103(a) (Infanti in view of AAPA)

Claim 58 was rejected under 35 U.S.C. Section 103(a) as being unpatentable over Infanti

(Microsoft Visio 2002: 10 Minute Guide, 2002) in view of “Applicant’s Admitted Prior art” (AAPA).

The Examiner asserted that AAPA teaches network diagrams which are used to represent biological activity, and that it would have been obvious to have included biological information into the Visio system to represent biological information in a manner easily interactive for users.

Applicants respectfully traverse. As noted above “AAPA” specifically discloses at paragraph [0008] that], that Visio is not adapted for building biological diagrams, and therefore is not suited for generating biological network information, such as protein-protein interaction networks, via knowledge extraction.

Further, claim 58 has been amended to recite “a local format infrastructural layer executable by said processor and configured to transform specific biological information represented in a text, experimental data or biological diagram to a local format in which the specific biological information is represented in local format objects in a canonical or abstract representation that provides a common format, such that data from said text format, said experimental data forma and said biological diagram format are all representable in said local format and are exchangeable and useable together”. It is respectfully submitted that Infanti and AAPA both clearly fail to disclose or suggest the local format infrastructural layer as claimed.

In view of the above amendments and remarks, the Examiner is respectfully requested to reconsider and withdraw the rejection of claim 58 under 35 U.S.C. Section 103(a) as being unpatentable over Infanti (Microsoft Visio 2002: 10 Minute Guide, 2002) in view of “Applicant’s Admitted Prior art” (AAPA), as being inappropriate.

Conclusion

Applicants submit that all of the claims are in condition for allowance, which action is requested. If the Examiner finds that a telephone conference would expedite the prosecution of this application, please telephone the undersigned at 408-736-3554.

The Commissioner is hereby authorized to charge any underpayment of fees associated with this communication, including any necessary fees for extensions of time, or credit any overpayment to Deposit Account No. 50-1078, order number 10030635-01.

Respectfully submitted,

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